



2016 Top Markets Report **Smart Grid** Country Case Study

Canada

As the United States' top trading partner and a world leader in advanced smart grid deployment, Canada ranks first overall in the *Top Markets Report*. U.S. exporters are highly competitive and face minimal barriers to doing business in Canada, which is far and away the top export destination for U.S. T&D equipment manufacturers. There is still a high potential for growth in this market as Canada needs to invest in its aging electricity infrastructure, and certain provinces, such as Alberta and Ontario, are currently planning multi-billion dollar build-outs and upgrades to transmission lines.

Smart Grid
ICT

1

T&D
Equipment

9

Overall
Rank

1

In the Smart Grid ICT market, energy policy drivers and regulatory frameworks are in place to help sustain growth and incentivize utility investment in new applications, including demand response and consumer energy efficiency programs.

It is important to note that provincial policies and regulations play a dominant role in Canada's energy sector, where power sector regulation authority resides with the provincial governments. Therefore, smart grid opportunities will vary across provinces accordingly. Still, Canada has been a global leader in areas like smart meter deployment with rollout across all provinces near completion. Ontario was one of the first provinces to complete smart meter deployment. Further major investments are anticipated in British Columbia's energy efficiency market, Quebec's advanced metering infrastructure, and Ontario's market for non-generation regulation resources and services.

Market Overview

Canada's large territory is endowed with a rich and varied set of natural resources, enabling the country

to rank among the five largest energy producers globally. Canada is the largest foreign supplier of energy to the United States, having supplied 62 billion kilowatt hours of electricity in 2013 alone. Canada currently has an estimated 133 GW of installed electricity generation capacity, dominated by hydropower (approximately 77 GW), but with a growing share for wind energy due in part to highly supportive federal and provincial policies. Canada's ongoing efforts to transition its power supply and upgrade its electricity infrastructure should be a major driver of T&D and smart grid investment for years to come. Eighty percent of power-generation facilities in Canada are scheduled to be replaced in the next 10-15 years and Natural Resources Canada's 2011 Clean Technology Report estimated that the smart grid industry in Canada will grow between \$520 million and \$2.1 billion by 2020.

Each province is planning further T&D infrastructure upgrades and modernizations, including new transmission line deployment.

Today, the majority of Canadian households have "smart" or "advanced" meters installed. Although

Overview of ITA's Analysis: CANADA

Strengths

- Top trading partner
- Policy drivers and facilitative regulations in place
- Market access and high U.S. competitiveness

Key Trends

- Continued leadership in transition to renewable resources
- Mature smart meter market with moderate growth
- Opportunities for time of use, demand response, and other advanced applications

Risks

- Provincial-level regulations are key
- Privacy and cyber security issues currently being addressed

annual deployments of smart meters nationwide slowed in 2013 as the deployment was near completion, *Bloomberg New Energy Finance* predicts deployments to remain at approximately 1 million units per year through 2018.

While all provinces have deployed smart meters to varying degrees, Ontario is by far the largest market and the nation's leader in terms of smart grid applications, including the utilization of time-of-use (ToU) pricing. Importantly, other cities and provinces appear to be following Ontario's lead. Montreal has embarked on a new round of smart meter deployment and is moving toward ToU pricing. While Alberta and British Columbia are not planning to switch to ToU in the near-term, both provinces continue to invest in energy efficiency programs.

Policy and Regulatory Environment

Canada's 10 provinces and three territories each govern their own natural resources, and each province has developed an electricity grid and market that is largely independent, though border provinces are well-integrated with the U.S. grid to facilitate north-south trade. The North American Electric Reliability Corporation (NERC) oversees electricity trade and reliability in Canada, similarly to its role in the United States, including in the development of standards for most provinces.

Due to its large hydropower endowment, electricity prices in Canada have traditionally been among the lowest in the world. Anticipated investment in aging electric power infrastructure and the shift towards non-hydro renewable and low-carbon sources will likely increase prices over the next decade.

At the national level, Canada's energy policy is increasingly driven by climate change targets. In 2010,

the Canadian Government announced its target of 90 percent emission-free electricity by 2020. Federal regulations require that plants reduce GHG emissions to no more than 420 metric tons on average of CO₂ per gigawatt hour of electricity produced, though most provincial policies are actually accelerating the transition from coal in their jurisdictions, with Ontario being the first to eliminate coal based generation in 2015. A new Canadian Prime Minister, Justin Trudeau, was elected in October 2015 and has since pledged his commitment to prioritize renewable energy policies, which should have positive effects on smart grid deployment as well.

Canada and the provinces have taken important steps to help finance investment in the clean energy sector, and private and public stakeholders alike are cooperating on research and development and other projects that are open to international suppliers and partners.

Top Markets Analysis

Canada is one of the most advanced countries in the world in terms of its smart grid development. According to a 2012 report, Canadian awareness levels of smart meters are higher than those of the United States, and the potential for consumer energy efficiency programs to drive additional savings for both households and utilities were shown to be positive. Due to the fact that parts of Canada are at an advanced stage of smart grid deployment, opportunities for highly competitive U.S. ICT firms will be ripe. With a shared transmission network and a history of cooperation on standards, issues of interoperability for U.S. smart grid exporters to Canada will be minimized.

Electricity sector regulations throughout Canada continue to facilitate smart grid deployments and

support energy efficiency as a tool to meet climate and energy policy goals for the country. Ontario has been a world-leader in smart grid deployment and is helping to drive developments in the rest of Canada as well. Over 2.6 million customers in Ontario can now access their smart metering data through a “Green Button” format that enables energy monitoring and opens the market to a variety of consumer energy efficiency applications.

Ontario is also at the forefront in addressing issues arising at the leading edge of smart grid technology deployment. Led by its Information & Privacy Commissioner, the province is working to address consumer privacy concerns and reach out to the smart grid business community with the *Privacy by Design* international standard. These efforts, combined with commitments by both utilities and the public to improve energy efficiency, will help drive opportunities in Canada’s smart grid ICT market that are matched by few other international markets.

Opportunities and Challenges for U.S. Companies

In 2015, Canada was the top ranked market for U.S. T&D exports, with \$556 million in export revenue. The need to upgrade and extend Canada’s aging electricity infrastructure to meet household, commercial and industrial demands will be a major driver of investment and opportunity for U.S. T&D equipment manufacturers. Recent investments include a \$3 billion project to construct two 500-KV transmission lines in Alberta, and a \$1 billion Lake Erie Clean Power Connector connecting the province to Pennsylvania through underwater transmission lines.

In the Smart Grid ICT realm, the relatively wide spread deployment of AMI in parts of Canada is now driving additional investment in utility IT systems and analytic software platforms and applications. Opportunities also exist for energy efficiency programs and systems marketed directly to consumers. There are a number

of smart grid segments that continue to develop in Canada, with higher growth expected in certain provinces that are developing emerging markets for the following technologies and applications:

- Advanced Metering Infrastructure (Alberta; Quebec)
- Household ToU Rates (Quebec)
- Demand Response (BC; Alberta)
- Outage Management (Ontario; Quebec; BC)
- Reactive Power Control Systems (Alberta; Manitoba; BC; Quebec; Ontario)
- Microgrids (Ontario; Quebec)
- Energy Storage (Ontario; Quebec)

Canada is also advancing the development of its electric vehicle (EV) market. Quebec and Ontario now offer electric vehicle rebates and have implemented other incentives. British Columbia Hydro is currently developing guidelines for the underlying smart grid infrastructure needed to support additional EV adoption.

Know Your Buyer

Canadian purchasers of U.S. smart grid goods and services include generation, transmission and distribution companies.

Summary of Resources

- U.S. Department of Commerce Canada Country Commercial Guide: <http://www.export.gov/ccg/canada090978.asp>
- Canadian National Energy Board: <http://www.neb-one.gc.ca/index-eng.html>
- Innovation, Science and Economic Development Canada: <https://www.canada.ca/en/innovation-science-economic-development.html>
- Statistics Canada: <http://www.statcan.gc.ca/start-debut-eng.html>